



THICKET-2022

SEMINAR ON THE TRANSFER OF COMPETENCE, KNOWLEDGE AND EXPERIENCE GAINED THROUGH CSNI ACTIVITIES IN THE FIELD OF THERMAL-HYDRAULICS

**To be held in *Greater Toronto Area – Canada*
*To Be Determined***

The Committee on the Safety of Nuclear Installations (CSNI) of the OECD Nuclear Energy Agency (OECD-NEA) proposes to hold a seminar for transferring competence, knowledge and experience gained through CSNI activities in the field of thermal-hydraulics. The seminar organisation will build on the experience gained with the THICKET seminars conducted in the thermal-hydraulic area in 2004, 2008, 2012, and 2016.

The seminar will be organised jointly by the Canadian Nuclear Society and the OECD Nuclear Energy Agency (NEA) and supported by the Canadian Nuclear Safety Commission. The seminar programme is attached.

Objective of the Seminar:

The objective of the seminar is transferring knowledge acquired through various CSNI activities to specialists unfamiliar with CSNI activities and to newcomers to the field. The knowledge, competence and experience acquired from activities carried out in the framework of CSNI during the last two decades, through activities such as State-of-the-Art Reports, Computer Code Validation Matrices, investigations on user effects, studies on uncertainty methods, International Standard Problem exercises, specialist workshops, etc. will be provided through lectures by internationally recognised CSNI experts. Managers and research planners would also benefit from attending the seminar. Relative to previous THICKET courses, the course content has been updated with recent activities [e.g., Best-estimate Methods Uncertainty and Sensitivity Evaluation (BEMUSE and PREMIUM), Computational Fluid Dynamics (CFD) including the Best Practice Guidelines and related benchmarks, the Safety Margin Assessment and Application (SM2A) and Spent Fuel Pool accident activity] as well as new developments from thermal-hydraulic OECD Projects.

Expected benefits:

- Most achievements of the CSNI are documented in dispersed reports that may not provide a coherent overall picture of current technology. Moreover, some CSNI reports have not received a wide distribution.

- The Seminar will provide good transfer of knowledge summarised in CSNI documents to a wide nuclear safety community.
- It will provide good transfer of experience and know-how from recognised experts who have been associated with CSNI activities since a long time.
- It will contribute to maintaining and increasing competencies, and to ensuring sustainable development of nuclear safety technology.

Participation:

The seminar is open to all qualified participants from research organizations, regulatory organizations, industry, and universities. The registration fee is approximately CAD 2,000 (the final cost will be determined when the number of participants is confirmed). Special discount may be offered depending on the number of participants from the same organization or in relation to participants from lower-income countries: please contact a member of the Organizing Committee before registering in these cases.

The registration fee will cover participation in the lectures, papers and presentations of lectures on CD-ROM, visit to the Darlington NPP, seminar dinner, lunches and coffee breaks. The participants will cover their own travel and living expenses.

Registration page will be open when enough commitments are received from member countries.

Final deadline for registration: Be Determined.

Should the number of attendants become too large, a limit will be imposed (currently a maximum of 40 participants is envisaged). Therefore, it is strongly advised to register early: registration will be recorded in the order of arrival of the registration forms and is guaranteed only upon receipt of payment.

Certificate:

A certificate of attendance will be distributed to the participants at the end of the seminar.

Language:

The lectures will be given in English. No translation will be provided.

Organizing Committee:

Nithy Nitheanandan (Chair) – *CNSC*

F. D’Auria (Co-Chair) – *UNIFI*

Wei Shen (Co-Chair) - *CNS*

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Seminar on Transfer of Competence, Knowledge and Experience Gained through CSNI Activities in the Field of Thermal-hydraulics

GREATER TORONTO AREA

Programme

Day 1

08:00 - 08:30	Registration
Session I:	Introductory Session – Chair N. Aksan
08:30 - 09:00	Welcome addresses by CSNI representative & CNS Executive – L1.1 (TBC - <i>Bill Magwood</i>)
09:00 - 09:30	Short Presentation on WGAMA Activities – L1.2 (<i>L. Herranz</i>)
09:30 - 10:00	Short Presentation on EC Activities – L1.3a (<i>TBD</i>)
10:00 – 10:30	Short Presentation on IAEA Activities – L1.3b (<i>TBD</i>)
10:30 - 11:00	Coffee break
11:00 – 11:15	The Program of the Seminar – <i>T. Nitheanandan</i>
11:15 - 12:15	Historical Perspective on the Role and the Achievements of CSNI in the Field of Thermal-hydraulics L 1.4 – <i>N. Aksan</i>
12:15 – 12:30	Evaluations and comments – Session I
12:30 - 13:30	Lunch break
Session II:	Phenomena in Nuclear Thermal-Hydraulics – Chair H. Glaeser
13:30 – 13:40	Introduction - <i>F. D'Auria</i>
13:40 - 14:35	CSNI Integral Test Facility Matrices for Validation of Best Estimate Thermal-Hydraulic Computer Codes L2.1 – <i>H. Glaeser</i>
14:35 - 15:30	CSNI Separate Effects Test Facility Matrices for Validation of Best Estimate Thermal-Hydraulic Computer Codes (including critical review) L 2.2 - <i>N. Aksan</i>
15:30 -16:00	Coffee break
16:00 – 17:00	A Review of Critical Heat Flux (CHF) Phenomena L 2.3 – <i>M. Corradini</i>
17:00 – 17:30	Open time for questions, evaluations and comments on Session II lectures L 2.1, L 2.2, and L 2.3

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Programme (Cont'd)

Day 2

08:00 – 08:30	Comments and (additional) questions about presentations on Day 1
08:30 – 09:30	A review for the Counter Current Flow Limitation (CCFL) phenomenon L2.4 – <i>H. Glaeser</i>
09:30 – 10:30	L2.5 A review for the Two-Phase Critical Flow (TPCF) phenomenon – <i>D. Bestion</i>
10:30 - 11:00	Coffee break
11:00 – 11:40	The 116 phenomena list L2.6 – <i>F. D'Auria</i>
11:40 – 12:00	The Critical Heat Flux (CHF) L2.7 – <i>C. Herer</i>
12:00 – 12:30	Open time for questions, evaluations and comments on Session II lectures L 2.4, L 2.5, L 2.6 and L 2.7
12:30 - 13:30	Lunch break
Session III:	Procedures in Nuclear Thermal-Hydraulics – Chair F. Reventos
13:30 – 13:40	Introduction - <i>F. D'Auria</i>
13:40 – 14:35	Validation in Nuclear Thermal-Hydraulics L 3.1 – <i>B- Bestion</i>
14:55 – 15:30	Scaling in Nuclear Thermal-Hydraulics L 3.2 – <i>F. D'Auria</i>
15:30 -16:00	Coffee break
16:00 – 17:00	Accuracy Evaluation and the Fast Fourier Transform Based Method (FFTBM) L3.3 – <i>A. Prosek</i>
17:00 – 17:30	Open time for questions, evaluations and comments on Session III lectures L3.1, L3.2 and L3.3

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Programme (Cont'd)

Day 3

Session III (Cont'd):	Procedures in Nuclear Thermal-Hydraulics – Chair F. Reventos
08:00 - 08:30	Comments and (additional) questions about presentations on Day 2
08:30 – 09:30	Uncertainty: Uncertainty Methodology Study (UMS), Best-Estimate Methods Uncertainty and Sensitivity Evaluation (BEMUSE) and Post-BEMUSE REflood Model Input Uncertainty Methods (PREMIUM) L3.4 – <i>H. Glaeser</i>
09:30 – 10:30	Sensitivity Analysis and Kv-Scaled Calculations L3.5 – <i>F. Reventos</i>
10:30 - 11:00	Coffee break
11:00 – 11:30	The user effect and the qualification L3.6 – <i>N. Aksan</i>
11:30 – 12:00	The Best Estimate Plus Uncertainty (BEPU) Approach L3.7 – <i>F. D’Auria</i>
12:00 – 12:30	Open time for questions, evaluations and comments on Session III lectures L3.4, L3.5, L3.6 and L3.7
12:30 - 13:30	Lunch break
Session IV:	Special Topics and Complexity – Chair D. Bestion
13:30 – 13:40	Introduction – <i>F. D’Auria</i>
13:40 – 14:35	Containment Nuclear Thermal-Hydraulics L4.1 – <i>L. Herranz</i>
14:35 – 15:30	Computational Fluid Dynamics (CFD) in Nuclear Thermal-Hydraulics L4.2 – <i>Y. Hassan</i>
15:30 - 16:00	Coffee break
16:00 – 16:40	The Primary Transport System in Nuclear Thermal-Hydraulics with Emphasis on the role of CFD L4.3 – <i>D. Bestion</i>
16:40 – 17:20	The Boiling Water Reactor Stability and Code Coupling L4.4 – <i>F. D’Auria</i>
17:20 – 18:00	CFD Perspectives L4.5 – <i>D. Bestion</i>
6:00 to 10:30	Official Dinner

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Programme (Cont'd)

Day 4

Session IV (Cont'd):	Special Topics and Complexity – Chair D. Bestion
08:00 – 08:30	Comments and (additional) questions about presentations on Day 3
08:30 – 09:20	The Boron issue in Pressurized Water Reactors L4.6 – <i>K. Umminger</i>
09:20 – 10:00	Status of 3-D code modelling L4.7 – <i>C. Herer</i>
10:00 – 10:40	Scaling applications L4.8– <i>C-H. Song</i>
10:40 - 11:00	Coffee break
11:00 – 11:30	Open time for questions, evaluations and comments on Session IV lectures L4.1 to L4.8
Session V:	Nuclear Thermal-Hydraulic Issues in CANDU Reactors – Chair T. Nitheanandan
11:30 – 12:15	Nuclear Thermal-Hydraulic Issues in CANDU design L5.1 – <i>D. Novog</i>
12:15 – 13:00	Nuclear Thermal-Hydraulics issues in CANDU safety L5.2 – <i>V. Snell</i>
13:00 - 14:00	Lunch break
14:00 – 17:30	Departure to Darlington Darlington NPP remarks

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Programme (Cont'd)

Day 5

08:00 - 08:30	Comments and (additional) questions about presentations on Day 4
Session VI:	OECD/NEA Projects in Nuclear Thermal-Hydraulics – Chair K. Umminger
08:30 – 08:40	Introduction - <i>F. D'Auria</i>
08:40 – 09:35	The Primary Coolant Loop Test facility (PKL) Project L6.1- <i>K. Umminger</i>
09:35 – 10:30	The Nuclear Energy Agency Rig-of-Safety Assessment (ROSA) Project L6.2 – <i>H. Nakamura</i>
10:30 - 11:00	Coffee break
11:00 – 11:45	The Advanced Thermal-hydraulic Test Loop for Accident Simulation (ATLAS) project L6.3 – <i>C-H. Song</i>
11:45 – 12:30	The PANDA project L6.4 – <i>N. Aksan</i>
12:30 - 13:30	Lunch break
13:30 – 14:15	The Spent Fuel Pool (SFP) project L6.5 – <i>M. Adorni</i>
14:45 – 15:30	The Core Exit Temperature (CET) issue in Nuclear Thermal-Hydraulics L6.6 – <i>H. Nakamura</i>
15:30 – 16:00	Open time for questions, evaluations and comments on Session VI lectures L6.1, L6.2, L6.3 and L6.4
Session VII:	Open discussion for the entire THICKET2020 – perspectives – Chair C-H. Song
16:00 – 16:30	Open discussion for the entire THICKET2020 – perspectives
16:30 – 17:00	Filling the Questionnaire
17:00 – 17:30	Distribution of Certificates End of THICKET 2020